Course Information

Course Title	Course Code Number	Credit Value
Multivariable and Vector Calculus	MATH 217	4

Prerequisites

A score of 68% or higher in one of PHYS 101, PHYS 107, PHYS 117, PHYS 153, PHYS 157, SCIE 001 and a score of 68% or higher in one of PHYS 102, PHYS 108, PHYS 118, PHYS 153, PHYS 158, SCIE 001 and a score of 68% or higher in one of MATH 101, MATH 103, MATH 105, MATH 121, SCIE 001.

Corequisites

One of MATH 152, MATH 221, MATH 223.

Contacts

Course Instructor	Contact Details	Office Location	Office Hours
Jim Bryan	jbryan@math.ubc.ca	Math Bldg. 226	Online, TBA

Course Structure

I will be broadcasting traditional blackboard lectures live from MATHX 1100 via Zoom. There will be a TA to monitor questions asked via chat or by using the hand raising featre in Zoom. The lectures will be recorded and posted afterward.

Learning Materials

Texts: *CLP-3 Multivariable Calculus Textbook* and *CLP-4 Vector Calculus Textbook* by Joel Feldman, Andrew Rechnitzer, and Elyse Yeager.

These locally developed texts are available at `http://www.math.ubc.ca/~CLP` . The companion Problem Books (draft versions) to these texts, available at the same site, will also be useful.

I will post assignments, lecture notes, and other course materials on Canvas. Students should sign up (through Canvas) to our Piazza page, and use it as a questions and answer forum.

Schedule of Topics

Here is our expected progress through the course laid out in weeks. A week is roughly 4 lecture hours. Corresponding sections of the texts are listed.

Week 0: coordinates, vectors, dot and cross products, lines and planes (CLP3: 1.1-1.5)

Week 1: curves, tangents, arc length, sketching surfaces, (CLP3: 1.6-1.9)

Week 2: functions of several variables, limits and continuity, partial derivatives, higher-order derivatives, equality of mixed partials (CLP3: 2.1-2.3)

Week 3: chain rule (CLP3: 2.4);

Week 4: tangent planes and linear approximation, directional derivatives and the gradient (CLP3: 2.5-2.7)

Week 5: maxima and mininma, Lagrange multipliers (CLP3: 2.9-2.10);

Week 6: double integrals, volumes, double integrals in polar coordinates (CLP3: 3.1-3.2);

Week 7: applications of double integrals, triple integrals, triple integrals in cylindrical and spherical coordinates (CLP3: 3.3-3.7)

Week 8: vector fields, line integrals, path independence (CLP4: 2.1-2.4, 1.6);

Week 9: parameterized surfaces, surface integrals (CLP4: 3.1-3.5)

Week 10: gradient, divergence, curl (CLP4: 4.1);

Week 11: the divergence theorem, Green's theorem (CLP4: 4.2,4.3)

Week 12: Stokes' theorem (CLP4: 4.4); examples and applications

Learning Outcomes

A list of learning goals will be posted on the course Canvas site.

Assessments of Learning

Grading Scheme:

Your grade normally will be given as the better of the following two schemes:

1. **50% Final Exam + 35% Midterm grades + 15% WebWork Grade**.
2. **Scaled Final Exam grade - 10%**

Please note that *grades may be scaled*.

Course Policies:

• There will be two midterms during the term. There are *no make-up midterms*. Missing a midterm for a valid reason normally results in the weight of that midterm being re-distributed to the remaining midterm and final exam. Any student who misses a midterm is to present the Department of Mathematics self-declaration form for reporting a missed assessment to their instructor within 72 hours of the midterm date. This policy conforms with the UBC Vancouver Senate's Academic Concession Policy V-135 and students are advised to read this policy carefully.

• No calculators or other electronic devices will be allowed for the midterms and final exam. Nor will formula sheets or other memory aids.

• Each week there will be an online Webwork homework set, accessed form Canvas.

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